

ANTHICIDAE OF THE GREATER ANTILLES,
AND A NEW SPECIES FROM VENEZUELA
(COLEOPTERA)¹

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Thirteen of the 29 species that are known or reported from the Greater Antilles appear to be endemic. Five (*Anthicus darlingtoni*, *hispaniolae*, *macgillavryi*, *soledad* and *subtilis*) make up the subtilis-group, which does not seem to have near relatives on the mainland. Three others stand quite isolated in their genera: *Acanthinus schwarzi* in an almost exclusively neotropical genus, *Anthicus blackwelderi* and *russoi* in a world-wide genus that contains many diverse elements. *A. blackwelderi* is counted among the endemic species because it has different color patterns on the islands that it is known to inhabit; the form of the internal sac of the male genitalia is very different from that of possible relatives on the mainland. *A. russoi* is probably not properly placed in *Anthicus*, and is unlike any anthicid known to me in several details; Menozzi's (1930) evidence that it is a myrmecophile with a native ant makes local origin seem logical.

The 5 other endemic species are similar to mainland New World species. *Mecynotarsus hispaniolae* and *jamaicanus* belong to the elegans-group, which has species from Florida to Central America. *Notoxus bipunctatus* and *jamaicus* have been assigned to the monodon-group (Chandler 1978), which ranges from Canada to northern South America. Finally, *Anthicus antilleorum* seems to have originated in the Greater Antilles and spread to the Virgin Islands and Bahama Islands; its nearest relatives are found around the southern Caribbean.

Within the 13 endemic species, there is inter-island variation in color pattern in 3: *Anthicus antilleorum*, *blackwelderi* and *soledad*; in each instance the Jamaican population is different from that of

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the adjacent island of Cuba (and Hispaniola in *antilleorum* and *blackwelderi*).

Two of the other 16 species listed are based on records that cannot be verified: *Acanthinus ebeninus* on an old specimen with a "Cuba" label, and *Amblyderus* sp. on some specimens from Puerto Rico that cannot now be located. Ten are shared with continental areas of the New World: *Acanthinus angusticollis*, *concinus*, *quinquemaculatus* and *scitulus*, *Anthicus pallidus*, *Sapintus similis* and *teapensis*, *Thicanus texanus*, and *Vacusus holoxanthus* and *vicinus*. These may have reached the Greater Antilles without human help, but *Vacusus holoxanthus* is found mainly from Chile to Bolivia, and *Acanthinus scitulus* seems not to have been present in the lowland localities that were extensively collected in the 1930's, so is probably of recent introduction. Finally, 4 species of *Anthicus* are of Old World origin: *floralis* and *formicarius*, which are almost cosmopolitan; *tobias*, which is expanding its range in several parts of the world; and *crinitus*.

Two large genera, the world-wide *Tomoderus* and the New World *Ischyropalpus*, are conspicuous by their absence. The latter genus, at least, should have been collected if it was present; mainland species are often abundant on blossoms. That the fauna has not been completely sampled is indicated by the addition of a species of *Mecynotarsus* from Hispaniola through the recent collecting of J. and S. Klapperich.

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Key to Greater Antilles Anthicidae

1. Prothorax with an anterior horn that extends over the head25
- Prothorax without a horn2
2. Sides of mesosternum curved outward to form a broad plate, with a variably developed fringe of setae along its edges.....15
- Mesosternum with sides diagonal and nearly or quite straight, without fringe setae.....3
3. First visible abdominal sternum with a transverse, pubescence-lined invagination behind each hind coxa. Elytral pubescence double, the under layer more appressed, diagonal.....24
- First visible abdominal sternum without invaginations. Elytral pubescence usually single, double in *Anthicus pallidus*...4
4. Elytral pubescence double, undercoat more diagonal. Pale, somewhat flattened, elytra with dark brown midband and suture, markings usually isolating a pale zone in basal and apical fourth of each elytron; head truncate. 2.25–2.35 mm. Hispaniola, Puerto Rico *Anthicus pallidus* Say
- Elytral pubescence simple5
5. Vertex of head somewhat produced, edge nearly straight from middle to weak temporal angles (Fig. 11). Uniform pale brown, somewhat shiny, elytra sometimes with a weak median cloud. Ca. 2.6 mm. Hispaniola, Puerto Rico
..... *Thicanus texanus* (LaFerté)
- Base of head from truncate to evenly rounded.....6
6. Base of head truncate, temporal angles narrowly rounded7
- Base of head rounded, temporal angles broadly rounded or not evident.....10
7. Head microreticulate between punctures. Rufescent to brown, elytra usually brown except across base. Elytral pubescence very short and inconspicuous. 2.9–3.2 mm. Jamaica *Anthicus formicarius* (Goeze)
- Head smooth and shiny between punctures8
8. Elytral setae sparse and as long as width of a femur, subdecumbent. Rufescent, shiny, elytra with dark markings that

- usually isolate a common pale spot in apical third. 2.5–3.2 mm. Puerto Rico, Virgin Islands
 *Anthicus crinitus* LaFerté
- Elytral pubescence shorter than width of a femur; dark elytral markings not enclosing a common pale spot in apical area 9
9. Elytral pubescence short and even, the erect tactile setae extending well above the decumbent setae. Prosternum with uniformly distributed punctures and pubescence in front of coxae. Elytra pale at base and usually in an obliquely oval spot in apical third of each. 2.0–2.3 mm. Jamaica, Cuba, Hispaniola, Virgin Islands and Bahama Islands; elytra usually lacking posterior pale spots in Jamaican population *Anthicus antilleorum*, sp. n.
- Elytral pubescence longer and less decumbent, the tactile setae barely evident among the setae. Prosternum with front half of portion in front of coxae smooth, back half bearing some coarse punctures and setae. Uniformly dark (Jamaica) or elytra pale across base and at apex, the posterior marking rounded in front (Cuba, probably Hispaniola). 2.27–2.55 mm. *Anthicus blackwelderi*, sp. n.
- 10(6) Rufescent or paler, with pale appendages; elytra usually with suture and whole apical half black except for a round, very pale spot on each in apical third. 2.6–3.0 mm. ♂ tegmen with apex knob-like, lacking lateral tufts of setae. Jamaica, Virgin Islands *Anthicus tobias* Marseul
- Elytra usually with a complete or interrupted dark midband and an oblique pale subapical band, never with a round pale spot on each in apical third. ♂ tegmen pointed, with a tuft of setae on each side. *Anthicus subtilis*-group 11
11. ♂ front tibiae excavated in apical 2/5. Elytral midband often complete. 2.11–2.24 mm. Cuba.
 *Anthicus macgillavryi* Buck
- ♂ front tibiae simple 12
12. ♂ tegmen gradually tapered to apex, slender. Elytral markings dark, all connected along suture, including a dark zone across base. Ca. 2.5 mm. Hispaniola
 *Anthicus hispaniolae*, sp. n.
- ♂ tegmen not evenly tapered to apex. 13

13. ♂ tegmen very bluntly truncate at apex except for a small median point. Elytral midband complete in Cuban specimens seen, interrupted at suture in Jamaican specimens. 2.22–2.53 mm. Cuba, Jamaica *Anthicus soledad*, sp. n.
- ♂ tegmen with sides slightly constricted beyond middle 14
14. Antennae unusually long and slender. Elytral midband reduced to a pale brown triangle with point toward suture, on each side. 2.47–2.76 mm. Hispaniola *Anthicus subtilis* LaFerté
- Antennae not so slender. Elytral midband interrupted at suture, but mark truncate toward suture on each side. Elytra slightly inflated. 2.02–2.42 mm. Hispaniola *Anthicus darlingtoni*, sp. n.
- 15(2) Pronotum with a pair of small bumps near anterior edge of disc. Fringe setae of mesosternum closely appressed to mesepisterna. Rufous, elytra black or brown with basal fourth rufous in a well-demarcated zone; appearing glabrous and subopaque. 2.6–3.2 mm. Jamaica, Puerto Rico, Virgin Islands *Anthicus floralis* (L.)
- Pronotum without such bumps. Fringe setae of mesosternum at least slightly raised from surface of mesepisterna 16
16. Sides of prothorax not constricted, almost evenly tapered from widest part, near front, to basal impressed line . . . 17
- Sides of prothorax at least slightly constricted anterior to basal impressed line 18
17. Shiny, only erect tactile setae very obvious; luteous to rufous, elytra with apex and an interrupted submedian band dark. 2.3–2.8 mm. Jamaica, Cuba, Hispaniola, Puerto Rico, Virgin Islands *Vacusus vicinus* (LaFerté)
- Shiny but with surface partly obscured by appressed pubescence; tactile setae short and inconspicuous. Moderately slender, entirely tannish. 1.8–2.0 mm. Jamaica *Vacusus holoxanthus* (Fairmaire & Germain)
- 18(16) Pubescence fine, silky, moderately dense, appressed, covering all of elytra. Dull rufescent to brown, elytra with dark midband and apex, markings usually connected along suture 19

- Pubescence very sparse, or dense pubescence confined to postbasal transverse impression of elytra 20
19. ♂ fifth visible abdominal sternum excavated on disc; lobes of visible sternum 6 moderately broad. 2.6–3.2 mm. Cuba, Puerto Rico *Acanthinus quinquemaculatus* (LaFerté)
- ♂ fifth visible abdominal sternum simple; lobes of visible sternum 6 narrow. 2.4–3.0 mm. Hispaniola
. *Acanthinus concinnus* (LaFerté)
- 20(18) Elytra with a dense patch of white pubescence in postbasal transverse impression. Dark brown, shiny, otherwise glabrous with erect tactile setae; head triangular, it and pronotum longitudinally strigose. Ca. 2.8 mm. Cuba?
. *Acanthinus ebeninus* (LaFerté)
- Elytra without patch of dense pubescence in postbasal transverse impression 21
21. Head and prothorax strongly sculptured 22
- Whole dorsal surface smooth, shiny, punctures fine and indistinct, setae very short, sparse and inconspicuous, only erect tactile setae evident 23
22. Dark brown with quadrate yellowish white mark laterally in cuticle of postbasal transverse of elytra; head unusually large, it and prothorax with some longitudinal striations. 2.0–2.8 mm. Jamaica, Cuba
. *Acanthinus angusticollis* (LaFerté)
- Head and prothorax rufescent, elytra rufescent at base, with a complete luteous band in postbasal impression, brown behind. Head and prothorax rugose-punctate. 2.4–2.8 mm. Cuba. *Acanthinus schwarzi* Werner
- 23(21) Rufescent, elytra paler with brownish to almost black markings, at least in narrow, interrupted bands at basal and apical thirds, to dark with postbasal impression and a narrow postmedian band pale. Prothorax with a strong constriction that continues weakly across dorsum. Edge of mesosternal shelf visible from above, in front of elytral humeri. Head narrower than semicircular behind eyes. 2.0–2.9 mm. Cuba
. *Acanthinus scitulus* (LeConte)
- Pale rufescent, elytra pale rufescent at base, dark brown on humeri and behind postbasal transverse impression. Pro-

- thorax weakly constricted, almost evenly globular from basal impressed line to collar. Only fringe setae of mesosternum visible from above. Ca. 2.0 mm. Hispaniola
- *Anthicus russoi* Krekich
- 24(3) ♂ fifth visible abdominal sternum shallowly dished out on disc, the excavation flanked with some erect setae. Ca. 2.0 mm. Jamaica, Cuba, Hispaniola, Puerto Rico, Virgin Islands *Sapintus teapensis* (Champion)
- ♂ visible sternum 5 simple. Ca. 2.7 mm. Jamaica
- *Sapintus similis* Werner
- 25(1) Each side of prothoracic horn with 3 teeth, the apex about equal to a tooth. Visible abdominal sternum 1 without a pubescence-lined invagination behind each hind coxa. Length ca. 2 mm. *Mecynotarsus elegans*-group26
- Each side of prothoracic horn with 3-7 teeth, the apex considerably broader than any tooth. Visible abdominal sternum 1 with a pubescence-lined invagination behind each coxa. Prothoracic horn with a few ventrolateral pits. *Notoxus monodon*-group27
26. Elytra slightly inflated. Pubescence cinereous but with some intermixed ferrugineous scales on disc of pronotum and basal half of elytra; elytra piceous at base, in a postmedian band, and in a large posterior triangular marking on each. Jamaica *Mecynotarsus jamaicanus* Werner
- Elytra strongly inflated. Pubescence cinereous, with diffuse slightly darker to pale rufescent markings on disc of pronotum, dull brown on elytra from base along a broad zone to an apical pale cordate mark, and in a feeble slightly postmedian band and subapical band delimiting the cordate mark. Markings very weak in some individuals. Hispaniola
- *Mecynotarsus hispaniolae*, sp. n.
- 27(25) Dark elytral markings usually including some on sides that curve inward toward suture at apex. Tip of ♂ aedeagus truncate. Jamaica *Notoxus jamaicus* Pic
- Dark elytral markings not including any on sides behind an irregular transverse midband. Tip of ♂ aedeagus deeply split. Puerto Rico *Notoxus bipunctatus* Chevrolat

DESCRIPTION OF SPECIES

Measurements are given in 0.01 mm as head: length from vertex to clypeofrontal suture over width across eyes and behind; prothorax: length including collar over width at collar, maximum, at constriction, and across base; elytra: length over width at humeri where 45° angle would touch them, and maximum. Total length as given is the sum of head, prothorax and elytra.

***Anthicus antilleorum*, sp. n.**

Fig. 9, 19.

2.01–2.24 mm, rufescent, the legs luteous, elytra with a brown midband, the base and an oblique apical mark on each luteous. Head quadrate, antennae moderately thick toward apex; elytra somewhat inflated, even in fully winged individuals. Pubescence moderately short, almost appressed, the tactile setae evident above the setae.

Holotype ♂, 2.11 mm. Head 39/46,42; eyes 16/13, 32 apart, 16 from base, which is straight, the temporal angles narrowly rounded; sides almost straight behind eyes. Disc slightly flattened, with moderately large, deep punctures ca. 3 apart, except on midline of front; pubescence almost appressed, moderately conspicuous. Antennae ca. 77 long, 7 thick at segment 10, segments 7–11 forming a feeble club that is thicker than segment 1. Prothorax 47/24,44,32, its sides just perceptibly concave at usual level of constriction; anterolateral portion narrowly curved. Punctures strong, denser than on head, ca. 2 apart. Elytra perceptibly swollen, 125/53,73; punctures strong, ca. 3 apart; setae 5 long, slightly curved, almost appressed; tactile setae 5, suberect, slightly curved. Legs unmodified. Apical margin of visible abdominal sternum 5 just perceptibly convex.

Holotype: ♂, CUBA: Baraguá (IV-25-28, at light, C. F. Stahl) in MCZ. Paratypes: CUBA: Baraguá (same data, 6; II-10-26, L. C. Scaramuzza), Soledad nr. Cienfuegos (Apr. 1936, P. J. D.; V,VI-'39, C. T. Parsons), Cayamas (Mar.-May, E. A. Schwarz), Camagüey Prov.: Monte Imias nr. California (at light, June 7, 1959, M. W. Sanderson). HISPANIOLA: REP. DOM.: Bani (65m), Boca Chica (10m), and Ocoa (475m), all J. & S. Klapperich, 1971-73. Paratypes in MCZ, USNM, Basel Museum and collection of FGW. Not designated as paratypes: JAMAICA: Morant Bay (Chapin and Blackwelder, 4). VIRGIN ISLANDS: Tortola (BVI, Brandywine Bay, J. F. G. Clarke,

1). BAHAMA ISLANDS: Cat Island (Bennets Harbour, E. B. Hayden & L. Giovanolli, 2).

The specimens from Jamaica are darker than those from Cuba and Hispaniola, only one of them having the posterior pale elytral mark. The pubescence may be less appressed but the specimens are so abraded that they were identified with difficulty. This species is probably most closely related to *A. pauxillus* Champion, *panamensis* Werner, and *margaritae*, sp. n., from Guatemala, Panama, and eastern Venezuela, respectively. The color pattern is similar. The ♂ genitalia are similar, but the simple internal sac provides few clues to relationship. *A. panamensis* has the tegmen step-tapered.

***Anthicus margaritae*, sp. n.**

Fig. 8, 20.

1.90–2.20 mm, of form of *Anthicus panamensis* Werner and *antilleorum*, sp. n., differing from both species in having the head broader behind the eyes and gradually widened to the narrowly rounded temporal angles. Tegmen of ♂ genitalia convexly tapered as in *antilleorum*, but with the apex slightly more pointed. Antero-lateral angles of prothorax quite narrowly rounded, as in the above 2 species, differing mainly in this feature from *A. exiguus* Champion.

Holotype ♂, 1.92 mm; head 33/44,40; eyes 16/14, separated by 29,15 from base. Punctures of head ca. 3 apart, on slightly convex disc. Antennae 75 long, 7 thick at segment 10. Prothorax 46/20,42,31. Elytra slightly swollen but with very distinct humeri, 113/51,65. Punctures slightly sparser than on head, intervals smooth and slightly convex; setae ca. 9 long, not quite so decumbent as in *antilleorum*, tactile setae 9 and erect.

Holotype: ♂, VENEZUELA: I. Margarita: Puerto Fermin (12.48, Marcuzzi), in CASC, San Francisco. Paratypes: VENEZUELA: I Margarita: Puerto Fermin (same data, 10), Juan Griego (3.48, 2). Sucre: Carupan (9.48, 2). I am indebted to K. S. Hagen for the loan of these specimens, and for some additional specimens without labels. Paratypes in CASC and collections of KSH and FGW.

***Anthicus blackwelderi*, sp. n.**

Fig. 10, 13, 21.

2.27–2.55 mm, of aspect of a *Vacusus* species, head truncate, prothorax without a constriction, and elytra subparallel. Jamaican

individuals brown, with slightly paler legs, antennae and palpi. Cuban individuals with pale marking at base and apex of elytra. Moderately coarsely punctured.

Holotype ♂, 2.34 mm. Head 44/51,47; eyes 19/15, 35 apart, 20 from base, which is truncate with a slight impression at midline, the temporal angles narrowly rounded; disc slightly flattened, smooth, with strong punctures ca. 4 apart except on midline of front; setae decumbent. Antennae ca. 97 long, 7 thick at segment 10, which is slightly longer than thick. Prothorax 49/16,40,31, with even punctures denser than on head, ca. 2 apart, about as wide as intervals. Elytra 141/56,73, with feeble omoplates, as deeply punctured as head and prothorax, punctures ca. 3 apart; setae decumbent, 8, slightly curved; tactile setae 4, suberect. Underside of thorax with punctures slightly smaller than above; front part of prosternum, anterior to coxae, smooth in front half, with some punctures and suberect setae in back half. First visible abdominal sternum finely punctured, rest punctulate. Visible sternum 5 with its apex gently convex, as in ♀; 6 with no indication of even an emargination; last visible tergum shiny, its edge beaded, almost concealed by the tergum before it, which is densely short-pubescent and has an almost evenly rounded apex, as in ♀.

Holotype: ♂, JAMAICA: Kingston (no date, Chapin & Blackwelder) in USNM. Paratypes: JAMAICA: Kingston (C & B, 4; P J D, 1), Morant Bay, Gordon Town, Trinityville, Bath St. Thomas, Blue Mts. (nr. 4500', P.J.D.). Paratypes in USNM, MCZ and FGW collection. Not designated paratypes: CUBA: Oriente Prov.: coast below Pico Turquino (1); Soledad nr. Cienfuegos (2). HISPANIOLA: Rep. Dom.: Constanza (1♀). The Constanza specimen has very reduced dark elytral markings, with rounded posterior emargination. Even teneral Jamaican specimens have uniformly colored elytra.

Anthicus russoi Krekich

Fig. 5, 22.

Anthicus russoi Krekich in Menozzi 1930: 93 (type-locality: Moca, Rep. Dominicana).

Stricticomus russoi: Bonadona 1981: 275.

♂, Jarabacoa, 2.20 mm, very smooth, shiny, appearing somewhat glabrous except for long, erect tactile setae; body and basal 36 of elytra pale rufescent (abdomen brown in another specimen); humeri

and apical area of elytra brown. Head semicircular behind eyes; prothorax evenly swollen in profile at level of widest portion.

Head 42/45,39; eyes prominent, 17/13, 27 apart, 20 from base. Disc evenly convex, punctures ca. 4 apart, small but distinct on front, very fine behind; setae ca. 1, decumbent, almost invisible, tactile setae erect, 7, fine. Antennae 105 long, 7 thick at segment 10, gradually thickened, with moderately conspicuous suberect curved setae ca. 4 and erect, nearly straight tactile setae ca. 7. Prothorax 47/18,36,25,28; portion anterior to strong basal impressed line almost globular, rising 11 above line from top of base to top of strong collar. Elytra 131/50,67; humeri well defined, omoplates slightly swollen; postbasal transverse impression well indicated but with punctures and pubescence like rest of elytra; punctures very fine, ca. 5 apart, setae decumbent, fine, ca. 1, barely visible, tactile setae erect, nearly straight, 11. Mesosternum extremely smooth, flat, with lateral expansion 15 wide and reaching almost to epipleura of elytra, bearing a fringe of slightly curved setae ca. 11 long, partly visible from above, the lateral and posterolateral setae lapping onto sides of elytra and mesepisterna. Metasternum, abdomen and legs with sparse, decumbent setae ca. 4 long, slightly denser on tibiae. Visible sternum 5 with disc evenly convex, its apex shallowly emarginate and bearing several long setae; 6 ca. 11 wide, divided into almost parallel, deeply separated lobes, which are deeply grooved mesally. Last visible tergum thin, nearly flat. Wings apparently absent. Cuticle very translucent, some parts almost transparent.

Records: HISPANIOLA: REP. DOM.: Jarabacoa (530m, 23.I.1972), and Boca Chica (10m, 6.X.1971), both on single ♂ specimens, collected by J. & S. Klapperich, and in the Basel Museum. These specimens agree in general with the original description, which may have suffered from being translated from German into Italian, and finally from my translation to English. The original figure is not helpful. Professor M. Princippi informs me that there is a specimen of *russoi* in the Menozzi Collection at the Istituto di Entomologia of the Università di Bologna. This must be the holotype, since the species was described from a single specimen.

I am leaving *russoi* in *Anthicus* for lack of a better place to put it. The mandibles and gonopore armature are different from *Acanthinus*, and the mesothorax differently designed from *Formicilla*. In

that genus the setae on the sides of the mesothorax arise from a ridge above the side of the expanded mesosternum. Bonadona has placed it in *Stricticomus*, an Old World group characterized by the shape of the prothorax. While this is a convenient way to split up the numerous species of *Anthicus*, the division has not been defined on a phylogenetic basis.

Anthicus subtilis-group

Five species of *Anthicus* in the Greater Antilles form a very distinctive group. The males have a unique tuft of long setae on the sides of the tegmen and the species share enough external features that two of them are indistinguishable in the female sex. Of the five, two have been taken only on Hispaniola, one only on Cuba, one on Hispaniola and Cuba, and one on Cuba and Jamaica, the last with some geographical variation on the two islands. All three species on Hispaniola are at least partly sympatric, as indicated by the labels, as are two on Cuba.

Anthicus subtilis LaFerté

Fig. 1, 18.

Anthicus subtilis LaFerté 1848: 135-6 (type-locality: LaFerté states it as Colombia, collected by Moritz, but the specimens probably originated in the Greater Antilles).

2.47-2.76 mm, pale rufescent, legs, antennae and palpi dull luteous, tibiae obscurely darker at base, elytra with pale brown median marking widely interrupted at suture and more or less triangular with a mesal point, and a narrow, usually paler, diagonal subapical band. Pubescence short, fine, almost appressed, dulling the generally shiny surface; punctures fine and not very evident except on base of pronotum. On the elytra the pubescence in this and the other species of the *subtilis*-group is slightly diagonal over most of the surface, to ca. 45° in the postbasal transverse impression and nearly transverse on rear of the weak omoplates.

♂, Ennery, Haiti, 2.66 mm. Head 44/53,47, almost semicircular behind prominent eyes, with a slight impression at midline. Eyes 22/16, 35 apart, 16 from base. Disc evenly convex, shiny, with small, well-defined punctures ca. 5 apart, and more numerous very fine punctures on intervals, punctures collectively ca. 1 apart. Setae fine, silky, decumbent. Antennae unusually slender, segments 16/7,

9/5, 11/5, 15/5, 16/5, 16/5, 15/5, 14/6, 14/7, 13/7, 17/6, base to apex. Prothorax 54/20,44,33,35, with well-defined collar and slight constriction. Collar without dense pubescence ventrally. Disc evenly convex, punctures ca. 1 apart, finer and with intervals nearly flat on anterior 1/3, larger and grading to finely rugulose in region of basal impressed line. Elytra 169/64,86, widest near middle, tapering to moderately narrow apex; omoplates distinct, transverse impression weak. Surface almost evenly covered with fine, slightly elevated punctures ca. 2 apart, intervals flat; setae fine, appressed, ca. 3, tactile setae suberect, 7. Setae of 2 slightly different lengths and thicknesses, the longer and thicker slightly less appressed and discernible with backlighting. Punctures and setae of impression no different from those of adjacent areas except for the setae being more perpendicular to the midline. Legs slender, not modified. Visible sternum 5 simple, its apex truncate.

The median dark elytral markings on this individual are 37 long, separated by 30 across suture, and 9 from side margin; subapical band ca. 11 wide, paler than median marks, slightly oblique, extending forward along suture for ca. 18, pale and evanescent laterally, to 7 from margin. All of the specimens have rather similar markings, and none has the median markings connected across the suture.

Records: All individuals are fully winged and apparently capable of flight. HISPANIOLA: HAITI: Ennery (nr. 1000' (4♂, 5♀), Camp Perrin (nr. 1000', 2♂), N.E. foothills of La Hotte (3000', 1♂). REP. DOM.: Villa Altagracia (1♂), Pto. Plata (25 km. S. of, 2♀), San José de las Matas (1-2000', 1♀). CUBA: Loma (Pico) del Gato (Sierra Maestra, Oriente Prov., 2♂), Soledad nr. Cienfuegos (1♀). Almost all collected by P. J. D.

I am applying LaFerté's name to this species largely on the basis that his description matches it quite well and that he particularly noted unusually slender antennae. He had two specimens to study, one in the Dejean collection and one in his own, the source of both being a series in the museum at Berlin, and ultimately the collecting of Moritz. I have seen the specimen in the LaFerté collection and compared it with West Indian material, but did so before I realized that there are several species in the subtilis-group. I have never seen a specimen of this group from a continental area. According to W. Horn's *Entomologische Sammlungen*, C. Moritz collected in both Colombia and Puerto Rico in the 1830's. It is likely that some labels got mixed.

Anthicus darlingtoni, sp. n.

Fig. 3, 17.

Generally similar to *subtilis* but smaller, 2.02–2.42 mm, head slightly truncate and with more distinct punctures, antennae not so slender, elytra more rounded at apex, median elytral markings usually darker and barely narrowed mesally, and subapical band very faint. Some individuals, including the holotype, lack wings and have the elytra slightly inflated.

Holotype ♂, 2.06 mm. Head 36/46,41, subtruncate with broadly rounded temporal angles. Eyes 17/13, 31 apart, 15 from base. Disc evenly convex, shiny, with evenly distributed punctures ca. 1 apart, small but well defined; diameter of punctures, including down-curved borders, about equal to intervals. The larger punctures described in *subtilis* are barely larger than those on the intervals. Antennae not unusually slender, segments 13/6, 7/5, 9/5, 10/5, 11/5, 11/5, 11/5, 11/5, 11/6, 10/7, 16/7, base to apex. Prothorax similar to *subtilis*, 44/16,41,27,31. Elytra 126/49,69, similar but apex more rounded and impression weaker. Fully winged individuals are more similar. Surface slightly more deeply punctured, punctures ca. 2 apart; setae similar, ca. 4, tactile setae ca. 7. Legs not modified. Apex of visible sternum 5 very feebly excavated. Median elytral markings 29 long, separated by ca. 18 across suture, 4 from side margin; subapical band much paler, barely a cloud, ca. 11 wide.

Holotype, ♂, HAITI: Etang Lachaux (under 1000', Oct. 26–27, '34, P. J. Darlington, WL) in MCZ. Paratypes: HAITI: Etang Lachaux (same data, 2 WL ♂, 1 WL ♀), Camp Perrin (nr. 1000', 1 F ♂, 1 WL ♂, 2 F ♀), Damien (2 F ♀), Port-au-Prince (1 WL ♂), Miragoane (2 WL ♀), Ennery (nr. 1000', 2 WL ♀), Mt. La Hotte (Tardieu, 3000', 1 WL ♀), Kenskoff (nr. Port-au-Prince, 4–6000', 1 F ♀). All specimens were collected by P. J. Darlington between September and November, 1934.

In at least two localities this species is sympatric with *subtilis*, but it appears to have a narrower range. Six of the specimens have full wings (F) and 11 are entirely wingless (WL).

Anthicus hispaniolae, sp. n.

Fig. 2, 16.

Larger than *subtilis* and the other species of the group, 2.68–3.11 mm, and with more extensive and darker markings on the elytra,

these tending to be connected along the suture but not along the sides. Most of the head and prothorax brown, elytra with base to transverse impression, a midband and an oblique subapical band brown, these connected at least narrowly along suture; subapical band paler in part of the series. Rest of elytra, legs, palpi, antennal segments 1 & 2, and usually labrum, mandibles except for tips, and head adjacent to antennal insertions luteous. Dark midband and subapical band not reaching side margins. Underside and abdomen pale brown. Head and prothorax densely, finely punctured. Tegmen of ♂ genitalia very slender and tapering almost evenly to narrow tip.

Holotype ♂, 2.68 mm. Head 42/56,49. Eyes 25/18, 36 apart, 15 from base, which is subtruncate with a shallow median impression, the temporal angles broadly rounded. Disc evenly convex, shiny, but punctures ca. 2 apart and broader than intervals. Antennal segments 1–2 pale, 1 heavier than usual; segments 18/11, 9/5/ 12/5, 13/5, 15/5, 17/6, 15/6, 14/6, 13/7, 13/7, 18/7, base to apex. Prothorax 52/22,47,37,42; punctures very dense, 2 apart, intervals very narrow, especially in back half. Elytra 175/69,95, with distinct omoplates and postbasal impression; punctures small, ca. 2 apart, intervals flat and about as wide as punctures; setae moderately dense, decumbent, 4, part slightly less decumbent, 5; tactile setae ca. 6. Legs simple; visible sternum 5 truncate.

Holotype, ♂, REP. DOM.: Constanza to Jarabacoa (2–4000', Aug., '38, P. J. Darlington) in MCZ. Paratypes: REP. DOM.: same data (2♂), foothills of Cordillera Central (S. of Santiago, 1♂). HAITI: N.E. foothills of La Hotte (2–4000', 1♂). The last locality is almost the same as where one *subtilis* was collected. All collected by P. J. Darlington in Oct., 1934, and June and Aug. 1938. All specimens are fully winged, and apparently capable of flight.

***Anthicus soledad*, sp. n.**

Fig. 4, 14.

Generally similar to *subtilis* but smaller, 2.22–2.53 mm, elytral markings darker, median elytral markings nearly or quite a complete band in Cuban individuals, interrupted at suture in those from Jamaica. Head slightly more truncate and deeply punctured, antennae not unusually slender. Unique in having the apex of the ♂ tegmen nearly truncate, with a median point. Cuban specimens are so similar to *macgillavryi* Buck that females cannot be identified.

Holotype ♂, 2.33 mm. Head 40/49,44, subtruncate with broadly rounded temporal angles, slightly impressed at middle. Eyes 19/14, 33 apart, 16 from base; surface similar to *subtilis* but with fine but distinct punctures ca. 2 apart, most slightly narrower than intervals, with gradually downcurved borders. Antennal segments 13/6, 7/5, 9/5, 11/5, 12/5, 13/5, 14/5, 13/5, 13/6, 11/7, 16/6, base to apex. Prothorax similar, 47/18,39,27,33. Elytra 145/55,79, shiny, punctures distinct, ca. 3 apart and almost as wide as intervals; setae ca. 4 long, tactile setae 6. The midband on this and other Cuban specimens is complete, slightly paler at suture; subapical band broad and dark, connected to midband at sides and narrowly at suture, leaving a diagonal mark on each elytron and apex pale; base onto omoplates somewhat darkened. Jamaican individuals lack the basal darkening, have the midband interrupted at the suture, and the subapical band connected to it only at the sides. Legs unmodified. Apex of visible sternum 5 feebly excavated.

Holotype, ♂, CUBA: Soledad nr. Cienfuegos (Oct. 21, '26, P. J. Darlington, F) in MCZ. Paratypes: CUBA: Soledad (2 F ♂), Cayamas (5 R ♂). JAMAICA: Rio Cobre (5 mi. above Spanishtown, 1 F ♂, 1 R ♂, 1 WL ♂), Ocho Rios (1 WL ♂), Blue Mts. (Whitefield Hall, nr. 4500', 1 R ♂), Milk River (1 F ♂). Five of the males are fully winged (F), 7 have reduced wings (R), and 2 are wingless (WL). In addition 5 fully winged females from Jamaica are identified with this species but not included as paratypes: Whitefield Hall (2), Milk River (2), and Mandeville (1, dead in light globe). Paratypes in MCZ, USNM and collection of FGW.

Anthicus macgillavryi Buck

Fig. 12, 14.

Anthicus macgillavryi Buck 1960: 69-70 (type-locality: Manicaragua, CUBA, but holotype is a ♀ and not conclusively identifiable as the species redescribed here).

2.11-2.24 mm, extremely similar to sympatric *soledad* individuals on Cuba, ♂ differing in having the front tibiae excavated in apical 2/5 and in having the tegmen of the genitalia slightly constricted beyond middle, similar to *subtilis* and *darlingtoni*. Elytra with dark midband complete in all specimens identified.

♂, Soledad, 2.20 mm. Head 36/48,41; eyes 18/15, 31 apart, 13 from base; antennal segments 13/7, 8/5, 9/4, 11/5, 13/5, 13/5, 13/5,

12/5, 12/5, 11/7, 17/5, base to apex. Prothorax 47/17,40,27,31; elytra 138/56,75; setae ca. 4, tactile setae 5. Front tibiae gradually thickened from base to 6 thick at 16 from base, zone beyond thickest portion moderately abruptly thinned to slightly more than 4 in a gently concave, flattened zone ca. 6 wide, this lined with moderately dense, pale, decumbent setae. Front tarsi not modified. Apex of visible sternum 5 feebly excavated.

Records: CUBA: Soledad, nr. Cienfuegos (5 F ♂, 5 WL ♂), Baraguá (at light, 1 F ♂), Cayamas (2 F ♂, 6 R ♂), Limones (1 WL ♂). Of the 20 specimens identified, 8 have full wings, 6 reduced wings, and 6 are wingless.

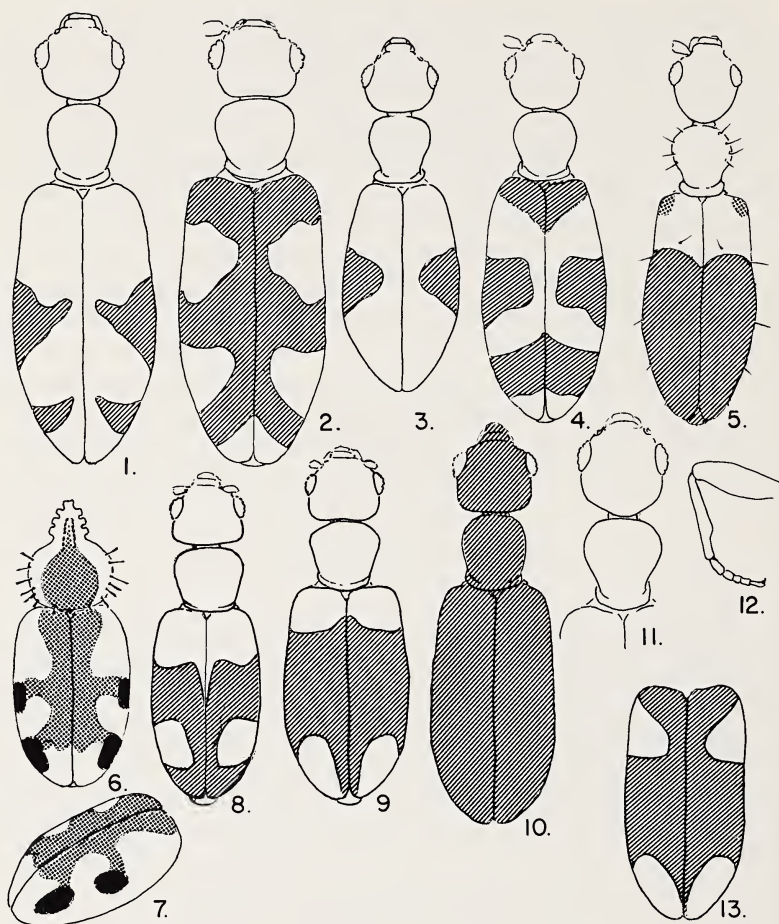
This species is more abundant than *soledad* on Cuba, so is the more likely one to be associated with Buck's name. The holotype and all 15 paratypes sent from the Amsterdam collection are females, so no part of the type series can be included in the records.

***Mecynotarsus hispaniolae*, sp. n.**

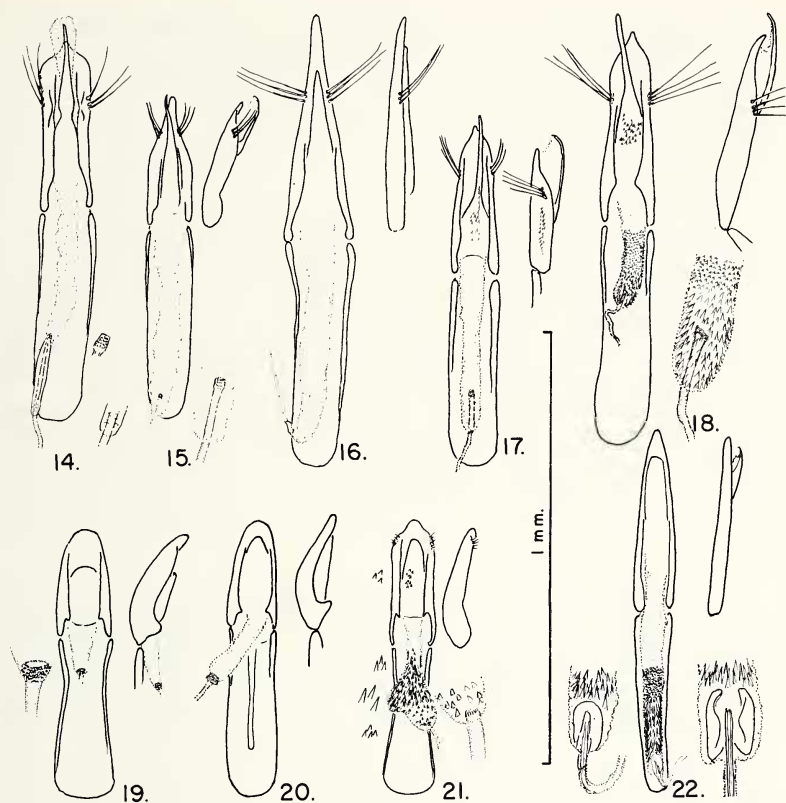
Fig. 6, 7.

1.56–2.04 mm (elytra plus prothorax including horn). Brown, appendages rufescent, surface largely concealed by appressed scales, which are cinereous but with a median rufescent cloud on the pronotum and dull brown markings on the elytra. The darkest of the elytral markings are lateral, one rounded and close to middle, the other larger, oval and subapical, both isolated from sides by a broad cinereous zone. Paler brown markings extend from the omoplate area to the level of the front of the subapical mark, with vague connections to both sets of dark marks. The background color of the elytra is slightly rufescent dorsally. Prothorax with a sparse fringe of long, erect, flattened, slightly clavate setae, on sides and onto base. Elytral scales of 2 different widths, the wider ca. 1½ times as wide, the 2 widths tending to be in alternate rows and the wider just perceptibly elevated.

Holotype: 2.04 mm; head 39/45,45; eyes small, 12/9, their curved scales ca. 1.5; 29 apart, 12 from base of head. Upperside of head flat, with sparse setae and some 12 long, suberect setae and well-developed erect, flattened setae on horn outline, 10–14 long. Prothorax 39 long, 82 with horn, 63 wide; horn 31 wide at widest, 12 thick. Marginal setae 9 long, the ones on base slightly shorter. Horn



Figures 1-13. Fig. 1. *Anthicus subtilis*, described specimen. Fig. 2. *A. hispaniolae*, holotype. Fig. 3. *A. darlingtoni*, holotype. Fig. 4. *A. soledad*, holotype. Fig. 5. *A. russoi*, described specimen. Fig. 6. *Mecynotarsus hispaniolae*, holotype. Fig. 7. Same specimen, oblique lateral view of elytra. Fig. 8. *Anthicus margaritae*, holotype. Fig. 9. *A. antilleorum*, holotype. Fig. 10. *A. blackwelderi*, holotype. Fig. 11. *Thicanus texanus*, Barahona, Rep. Dom., forebody. Fig. 12. *Anthicus macgillavryi*, front leg of described ♂. Fig. 13. *A. blackwelderi*, elytral markings of Cuban population, from coast below Pico Turquino.



Figures 14-22. ♂ genitalia of *Anthicus* spp., in ventral view, most with tegmen in left lateral view, details of internal sac and gonopore armature to sides. Fig. 14. *A. soledad*, paratype, Soledad, Cuba. Fig. 15. *A. macgillavryi*, Soledad, Cuba. Fig. 16. *A. hispaniolae*, paratype. Fig. 17. *A. darlingtoni*, paratype, Damien, Haiti. Fig. 18. *A. subtilis*, Villa Altagracia, Rep. Dom. Fig. 19. *A. antilleorum*, paratype, Cayamas, Cuba. Fig. 20. *A. margaritae*, paratype, Carupano, Venez. Fig. 21. *A. blackwelderi*, paratype, Kingston, Jam. Fig. 22. *A. russoi*, Boca Chica, Rep. Dom.

with a well-developed crest of 2 ridges, these up to 8 apart, and with 3 strong teeth on each side. Underside of horn with a sparse brush of suberect, anteriorly directed simple setae 10 long. Elytra 122/65,87, strongly inflated, punctures ca. 3 apart but obscured by dense scales ca. 4 long; no tactile setae discernible. Hind tibia 47 long, tarsus 61, front tarsus 29.

Holotype, ♀, REP. DOM.: Las Salinas b. Bani (10.X.1979, J. & S. Klapperich) in Natural History Museum, Basel, Switzerland. Paratypes: 2 ♀, same data, Basel and FGW collection.

Relationships: The species of *Mecynotarsus* in the elegans-group seem assignable to at least 3 subgroups. The first, already noted (Werner 1962), has the sutural area of the elytral apex pale, this zone restricted anteriorly by oblique dark bands. To this group belong *elegans* LeConte, *intermixtus* Werner, *jamaicanus* Werner, and probably *falcatulus* Chandler. In this group the male genitalia are distinctive, the phallobase bearing rounded lateral lobes. The male antennae are not expanded and the prothoracic horn is relatively narrow.

A second subgroup has the markings at the tip of the elytra based on a pale sutural mark and lateral spots, with a narrow extension from the oblique subapical bands tending to reach the very apex on each side, where there may be a tiny development of a pit in the male. This subgroup contains *balsasensis* Werner and *salvadorensis* Werner. These 2 species have a distinctive pale strip through discal clouding on the pronotum. Werner (1962) indicates that the phallobase is simple but Chandler (1977) states that there are lateral lobes in *salvadorensis*. Very small size of the genitalia makes interpretation difficult. The antennae are simple in the male and the horn is relatively narrow.

Finally, a third subgroup has each elytron pale at the apex, with a convex anterior border to the pale zone. The most distinctive feature is expansion of the intermediate antennal segments in the male, and simple phallobase of the male genitalia. The prothoracic horn is broader than in the other 2 subgroups, and any clouding on the pronotum lacks a median pale stripe. This last subgroup contains *nevermanni* Werner, *alvarado* Chandler, and *vafer* Chandler, with *sexnotatus* Champion assignable to it on male characters but having the elytral markings so reduced that they are difficult to interpret.

M. hispaniolae is probably a member of this third subgroup, but

no males have been collected. However, the more posterior dark mark on the elytra shows no sign of a posterior excavation, as is present in *alvarado* and *vafer*. The distinctive erect setae on the sides of the prothorax are matched in *alvarado* and approached in *vafer*, but are also approached in *salvadorensis* in the second subgroup. No other species has such differences between the broad and narrow scales, but there is some difference in *vafer*, *alvarado* and *salvadorensis*; the tendency may be more a function of denseness of scales than relationship. The long setae on the underside of the horn are matched in *vafer* and hinted at in some others in the third subgroup, *salvadorensis* in the second, and *intermixtus* in the first. The setae on the horn, and matching setae on top of the head, as well as the erect setae on the top of the head that outline the horn, probably have an adaptive value in keeping sand grains out of the space between head and horn when the beetle is digging. Degree of development might very well be habitat-related.

CHECKLIST OF SPECIES AND GREATER ANTILLES RECORDS

Acanthinus angusticollis (LaFerté) 1848: 120-1. Werner 1966b: 747-9, fig. 1, 3, 6, synonymy. Southern Brazil to northern South America. Introduced? CUBA: Bahia Honda, Camagüey, Cayamas, Havana, Santa Clara. JAMAICA: Kingston.

Acanthinus concinnus (LaFerté) 1848: 123. Werner 1970a: 123, fig. 7, 21. Bolivia to eastern Mexico. Introduced? CUBA: on ship from Cuba. HISPANIOLA: Rep. Dom.: Boca Chica, Colonia (1000 m), Haina, San Cristobal (35 m), San Francisco Mts., San José de las Matas, Trujillo Valdes (Boni), Villa Altagirica.

Acanthinus ebeninus (LaFerté) 1848: 117. Werner 1970a: 119, fig. 17.

Pseudoleptaleus cubanensis Pic 1917: 8 (type-locality: Cuba).

Venezuela and Colombia; reported from Guatemala without exact locality (specimen not seen). CUBA: only the Pic specimen, without specific locality.

Acanthinus quinquemaculatus (LaFerté) 1848: 115-6. Werner 1970a: 121-2, fig. 6, 20. Bolivia to eastern Mexico. Introduced? CUBA: Sabanilla. HISPANIOLA: Rep. Dom.: Boca Chica, Colonia (1000 m). PUERTO RICO: Flamboyant, Puerca Bay.

- Acanthinus schwarzi* Werner 1967: 1232, fig. 10, 23. Probably endemic. CUBA: Cayamas, Pinar del Rio, Soledad nr. Cienfuegos.
- Acanthinus scitulus* (LeConte) 1852: 94-5. Werner 1970b: 724-5, fig. 20-22, 34.
Formicilla cubana Pic 1944: 9-10 (type-locality: Cuba).
Formicillia gracillipes (sic): Buck 1960: 64, in part, Cuban specimens.
Honduras to southeastern U.S.A. Probably a recent introduction. CUBA. Hormiguero, Pinar del Rio. Through the courtesy of Ben Brugge, of the Zoological Museum of Amsterdam, I have examined most of the specimens reported by Buck. His specimen from Colombia belongs to *Acanthinus leporinus* (LaFerté). HISPANIOLA: Rep. Dom.: Boca Chica (10 m).
- Amblyderus* sp. Wolcott 1936: 210. PUERTO RICO: Ponce (on *Randia mitis* and other flowers). Identification was provided by H. S. Barber, but specimens cannot now be located. The blossom association makes the identification suspect, since the usual association of *Amblyderus* is sand dunes.
- Anthicus antilleorum* Werner. Native. Also in Virgin and Bahama Islands. CUBA, HISPANIOLA.
- Anthicus blackwelderi* Werner. Probably endemic. JAMAICA, CUBA, HISPANIOLA.
- Anthicus crinitus* LaFerté 1848: 204-5. Werner 1975b: 472-3, fig. 2, 5. Old World, becoming cosmopolitan. HISPANIOLA: Rep. Dom.: Bani, Mao Val-Verde, San Cristobal, St. Domingo, all near sea level. PUERTO RICO: Fortuna A. E. S., La Parguera, Ponce.
- Anthicus darlingtoni* Werner. Endemic. HISPANIOLA.
- Anthicus floralis* (L.) 1758: 420. Werner 1964: 233-4, fig. 18, 71. Cosmopolitan. JAMAICA: Trelawney. HISPANIOLA: Rep. Dom.: San Cristobal, St. Domingo. PUERTO RICO: Ponce.
- Anthicus formicarius* (Goeze) 1977: 705. Werner 1964: 234-5, fig. 19, 72. Cosmopolitan. JAMAICA: St. Andrew.
- Anthicus hispaniolae* Werner. Endemic. HISPANIOLA.

Anthicus macgillavryi Buck. Endemic. CUBA.

Anthicus pallidus Say 1826: 245. Werner 1964: 230-1, fig. 1, 2, 64, synonymy. Coastal areas, Florida to northern South America; Lesser Antilles. Probably native. CUBA: Maisi in Oriente Prov. HISPANIOLA: Haiti: Grande Anse. Rep. Dom.: Barahona. PUERTO RICO: Bayamon.

Anthicus russoi Kreckich. Probably a myrmecophilous endemic. HISPANIOLA.

Anthicus soledad Werner. Endemic. CUBA, JAMAICA.

Anthicus subtilis LaFerté. Endemic. CUBA, HISPANIOLA.

Anthicus tobias Marseul 1879: 125. Werner 1964: 235, fig. 12. Old World, becoming cosmopolitan; Virgin Islands. JAMAICA: Gordon Town, Morant Bay, Spanish Town. HISPANIOLA: Rep. Dom.: Boca Chica, San Cristobal, Santo Domingo, all near sea level.

Mecynotarsus hispaniolae Werner. Endemic. HISPANIOLA.

Mecynotarsus jamaicanus Werner 1962: 84, fig. 3, 10. Probably endemic. JAMAICA: Kingston.

Notoxus bipunctatus Chevrolat 1877: ix. Chandler 1978: 35, fig. 26, 57. Probably endemic. PUERTO RICO: Alsina, Anaso District, Coama Springs, Ponce, Rio Piedras, San Juan.

Notoxus jamaicus Pic 1913: 8-9. Chandler 1978: 36, fig. 27, 57. Probably endemic. JAMAICA: Alligator Pond Bay, Bull Run in St. Andrew Parish, Milk River, Morant Bay, Santa Cruz, Spanish Town, Trelawney.

Sapintus similis Werner 1983: 420. Mexico to Panama. Introduced? JAMAICA: Spanish Town.

Sapintus teapensis (Champion) 1890: 249. Southeastern Mexico to southern Brazil. Introduced? CUBA: Baracoa, Cayamas, Vinales. HISPANIOLA: Haiti: Desbarrière-Mt. La Hotte, Port-au-Prince. Rep. Dom.: Bani, Haina, La Romana, Monte Cristi, Puerto Plata. JAMAICA: Orange Bay, Santa Cruz, Spanish Town. PUERTO RICO: Tortuguero Lake.

Thicanus texanus (LaFerté) 1848: 301. Werner 1975a: 290, synonymy. Southeastern U.S.A. to eastern Texas, primarily coastal. Probably native. HISPANIOLA: Rep. Dom.: Barahona, Lake Enriquillo. PUERTO RICO: Ensenada.

Vacusus holoxanthus (Fairmaire & Germain) 1860: 3. Werner 1961: 808-9; 1966a: 219, synonymy.

Vacusus jamaicanus Werner 1961: 809.

Chile to southern Brazil. Probably introduced. JAMAICA: Gordon Town, Milk River, Morant Bay, Spanish Town.

Vacusus vicinus (LaFerté) 1848: 157-8. Werner 1961: 799-801, synonymy. Southern U.S.A. to Venezuela. Lesser Antilles. Introduced? CUBA: Baraguá, Camagüey, Cayamas, Havana, Hormiguero, Jatabonica, Manicaragua, Soledad nr. Cienfuegos. HISPANIOLA: Rep. Dom.: Bani, Boca Chica, Mao Verde, San Cristobal, Santo Domingo. JAMAICA: Bath St. Thomas, Clarkstown, Milk River, Morant Bay, Santa Cruz, Spanish Town, Trinityville. PUERTO RICO: Ensenada, La Guánica, Lajas, Mayagüez, Sabena Grande, Salinas. VIRGIN ISLANDS.

REFERENCES CITED

- BUCK, F. D. 1960. Anthicid beetles from Venezuela, Colombia, Cuba, and the Netherlands Antilles. Studies on the Fauna of Curaçao and other Caribbean Islands: No. 47, pp. 64-71. Martinus Nijhoff, The Hague.
- CHAMPION, G. C. 1890. Anthicidae (pp. 203-50, pls. 9-10). In: *Biologia Centrali-Americana. Insecta, Coleoptera Heteromera*, vol. 4, part 2 (1889-1893). R. H. Porter, London. x + 494 pp.
- CHANDLER, D. S. 1977. New *Mecynotarsus* with a key to the New World species (Coleoptera: Anthicidae). *Coleop. Bul.* 31: 363-70.
- . 1978. A revision of the Central and South American *Notoxus* and description of a new genus, *Plesionotoxus* . . . *Contrib. American Entomol. Inst.* 16(3): i-iv, 1-83 (as 1977).
- CHEVROLAT, A. L. A. 1877. Description d'espèces nouvelles d'Hétéromères provenant Île de Porto Rico . . . *Bul. Soc. Entomol. France* 7: viii-ix.
- FAIRMAIRE, L., AND P. GERMAIN. 1860. *Coleoptera Chilensia. Part 2. Sect. 1.* 8 pp. Paris.
- GOEZE, A. E. 1777. *Entomologische Beiträge zu des Ritter Linné 12. Ausgabe des Natursystems*, vol. 1. Weidmann, Leipzig. 736 pp.
- LA FERTÉ-SÉNÉCTÈRE, F. T. de. 1848. *Monographie des Anthicus et genres voisins* . . . De Sapia, Paris. xxiv + 340 pp., 16 pls.

- LECONTE, J. L. 1852. Synopsis of the anthicites of the United States. Proc. Acad. Natur. Sci. Philadelphia 6: 92-104.
- LINNAEUS, C. 1758. Systema Naturae . . . , ed. 10, vol. 1. Laurentii Salvii, Holm. 2 + 824 pp.
- MARSEUL, S. A. de. 1879. Monographie des anthicides de l'ancien-monde. L'Abeille 17: 1-268, 2 pls.
- MENOZZI, C. 1930. Una nuova specie, probabile mirmecophila, di *Anthicus* . . . della R. Dominicana. Boll. Lab. Zool. gen. et agraria del R. Inst. sup. agrario — Portici 25: 92-4.
- PIC, M. 1913. Descriptions de 29 espèces. Mém. Exotico-Entomol., fasc. 5: 8-9.
- . 1917. Descriptions abrégées diverses. Mém. Exotico-Entomol., fasc. 22: 2-20.
- . 1944. Opuscula Martialia, XIII. Echange, Numéro spécial: 1-16. Les Imprimeries Réunies, Moulins.
- SAY, T. 1826. Descriptions of new species of coleopterous insects inhabiting the United States. J. Acad. Natur. Sci. Philadelphia 5: 237-84, 293-304 (continued from 1825, *op. cit.* 5: 160-204.).
- WERNER, F. G. 1961. A revision of the genus *Vacusus* Ann. Entomol. Soc. America 54: 798-809.
- . 1962. The species of *Mecynotarsus* related to *elegans* Proc. Entomol. Soc. Washington 64: 79-86.
- . 1964. A revision of the North American species of *Anthicus*, s. str. Misc. Publ. Entomol. Soc. America 4(5): 195-242.
- . 1966a. Notes on the South American species of *Vacusus* Ann. Entomol. Soc. America 59: 218-22.
- . 1966b. A revision of *Acanthinus* . . . II *Op. cit.* 59: 746-51.
- . 1967. A revision of *Acanthinus* . . . VI *Op. cit.* 60: 1217-34.
- . 1970a. A revision of *Acanthinus* . . . VII. *Op. cit.* 63: 111-28.
- . 1970b. A revision of *Acanthinus* . . . IX *Op. cit.* 63: 718-31.
- . 1975a. New synonymy in the nearctic Anthicidae Proc. Entomol. Soc. Washington 77: 290.
- . 1975b. Additions to the nearctic *Anthicus* *Op. cit.* 77: 472-7.
- . 1983. Neotropical *Sapintus*, with a general key to species. Proc. Entomol. Soc. Washington 85: 405-425.
- WOLCOTT, G. N. 1936. Insectae Borinquenses Journ. Agric., Univ. Puerto Rico 20: 1-627.